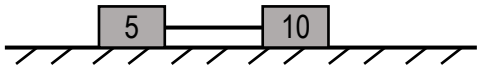
CONCEPT: CONNECTED SYSTEMS OF OBJECTS WITH FRICTION

- If 2+ objects are connected and friction is NOT negligible, you'll have to consider the friction on _____ object**.**
  - **Remember:** Connected objects have the same $\vec{v}$ and $\vec{a}$!

EXAMPLE**:** A 10kg block is tied via a string to a 5kg block on a rough table where μ_s = 0.5 and μ_k = 0.3**.** If you pull on the 10kg block with 90N, and the objects start moving, **a)** Draw FBDs for both blocks**; b)** find the acceleration of the blocks**.**



CONNECTED OBJECTS + FRICTION

1) Draw FBD for all obj's, choose direction of **+**
2) Determine if $\boldsymbol{f} = \boldsymbol{f_s}$ or $\boldsymbol{f_k}$ from text or:
If ΣFs on axis of motion > $f_{s,max}$, $\boldsymbol{f} = \boldsymbol{f_k}$
3) Write **ΣF=ma,** start with simplest (fewest **F**s)
4) Solve **a** (EQ Addition / Substitution)
5) Plug **a** into eq's, solve other targets if needed

PROBLEM: Two blocks are connected by a cord over a pulley. Block A rests on a rough tabletop. Block B has mass m_B=2kg and hangs over the edge of the table. The coefficients of friction between Block A and the tabletop are μ_s=0.6 and μ_k=0.4. What is the minimum mass Block A can have to keep the system from starting to move?

A) 3.33 kg
B) 5 kg
C) 32.7 kg

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